

# NASA TECH BRIEF



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## Dot Patterns Provide Reproducible Flaw Areas for Study of Adhesive Bonds

### The problem:

To devise a method of degrading portions of the surface of a substrate in a known, reproducible manner to enable study of adhesive bond strengths.

### The solution:

Photographically produce a small-dot pattern of known geometry on the surface to be subjected to adhesive bonding tests.

### How it's done:

The test surface is thoroughly cleaned and coated with a commercially available emulsion used in photo-etching. The applied coating is first dried at room temperature for 15 minutes and then in an oven at 100° to 150°F for 15 to 30 minutes. The resultant film on the test surface is covered with a photographic screen and exposed to a high-intensity carbon arc light for approximately 3 minutes. The exposed film is developed and washed to leave a screen-image pattern of small dots on the test surface. These dots adhere with relatively low strength to the test surface, so that in the aggregate they proportionately reduce the area on which an adhesive applied to the entire surface will be effective. By varying the screen size,

film dots of different diameter and spacing can be obtained for reproducibly testing the effects of simulated surface flaws on adhesive bond strengths.

### Notes:

1. In addition to providing a means of testing adhesive bond strengths, the dot patterns may conceivably have application in force-limiting devices which must depend on the adhesive bonding strength between mating surfaces.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B66-10367

### Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Gerald Schmitz and Louis Frank  
of General American Transportation Corporation  
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